Expression of a galactose-containing membrane-associated glycoconjugate by physiologically-characterised primary sensory neurones in the rat.

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Previous work in our laboratory has led to the suggestion that binding sites for the plant lectin *Bandeiraea simplicifolia* isolectin B4 (IB4) are expressed by nociceptive primary sensory neurones. IB4 has a high affinity for galactose and because binding sites for this lectin are expressed by the plasma membrane and Golgi apparatus of neurones it has been proposed that a galactose-containing membrane-associated glycoconjugate may be selectively expressed by nociceptors. However there is some debate regarding the classes of nociceptors that express this glycoconjugate. In order to help resolve this, we have screened different functional classes of primary sensory neurones for IB4 binding in the rat. Intracellular recordings were made from neurones in the sacral dorsal root ganglia of deeply-anaesthetised rats. Following physiological-characterisation, selected cells were labelled with neurobiotin. These cells were subsequently visualised in histological sections using a rhodamine-avidin conjugate and the presence of lectin binding determined using an IB4-fluorescein conjugate. To date a total of 27 primary sensory neurones were intracellularly stained and 19 of these were subsequently recovered and screened for IB4 binding. Of these, 14 were low threshold muscle or cutaneous sensory neurones and none of them expressed IB4 binding sites. The remaining five cells were activated by high intensity mechanical, thermal and chemical stimuli and had conduction velocities of 0.5 - 2.0 $m.sec^{-1}$. All 5 cells of this class of neurone were found to bind the lectin IB4. Collectively these findings suggest that a galactose-containing membrane-associated glycoconjugate may be selectively expressed by nociceptive primary sensory neurones in the rat.

Cell Type	No. of Cells	Resting Membrane Potential (-mV)			Action Potential (mV)			Conduction Velocity ($m.sec^{-1}$)			Mean Diameter (µm)			Cross Sectional Area ($µm^2$)		
		Range	Mean	S.D	Range	Mean	S.D	Range	Mean	S.D	Range	Mean	S.D	Range	Mean	S.D
LTSA	2	65.0 - 80.0	72.5	10.6	75.0 - 75.0	75.0	0.0	26.0 - 29.0	27.5	2.1	43.9 - 55.6	49.8	8.3	1026 - 1436	1231	289.4
LTRA	3	60.0 - 70.0	66.7	5.8	50.0 - 70.0	60.0	10.0	24.0 - 41.0	30.0	9.5	70.3 - 82.6	78.4	7.0	1852 - 3675	2650	932.4
PC	1	80.0	80.0		90.0	90.0		24.0	24.0		54.5	54.5		1346	1346	
MSA	2	60.0 - 70.0	65.0	7.1	70.0 - 80.0	75.0	7.1	N/A	N/A	N/A	58.2 - 87.8	73.0	20.9	1695 - 2094	1895	282.6
HFA	4	70.0 - 80.0	73.8	4.8	65.0 - 95.0	77.5	13.2	29.0 - 30.0	29.3	0.5	66.6 - 94.0	77.0	12.6	1530 - 3129	2446	782.0
D-HFA	2	65.0 - 70.0	67.5	3.5	80.0 - 85.0	82.5	3.5	8.5 - 15.5	12.0	4.9	37.7 - 59.4	48.6	15.3	783 - 1398	1091	435.0
HTM	9	50.0 - 90.0	60.0	12.5	30.0 - 80.0	62.2	15.0	1.5 - 17.0	9.0	6.3	27.4 - 61.0	45.9	11.4	474 - 1698	1062	390.2
PMN	5	50.0 - 83.0	64.6	14.3	50.0 - 70.0	58.0	8.4	0.5 - 2.0	1.0	0.8	27.7 - 38.3	32.2	4.4	373 - 672	534	139.4

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